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17EC32

Third Semester B.E. Degree Examination, June/July 2019
Electronic Instrumentation

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1   a. Define the following terms as applied to an electronic instruments:
      i)   Accuracy
      ii) Precision
      iii) Error
      iv) Resolution
      v)   Sensitivity   **(10 Marks)**

   b. A basic D'Arsonval movement with an internal resistance of 50Ω and a fall scale deflection current of 2 mA is to be used as a multirange voltmeter. Determine the series resistances to obtain the voltage ranges of 0-10V, 0-50V, 0-100V and 0-500V.   **(10 Marks)**

OR

2   a. Explain the working of a true RMS voltmeter with a suitable diagram.   **(10 Marks)**
   b. Explain the various types of thermocouple used in RF ammeter in detail.   **(10 Marks)**

Module-2

3   a. Explain the working of dual slope type DVM with a block diagram.   **(10 Marks)**
   b. With a neat block diagram, explain the working of frequency meter.   **(10 Marks)**

OR

4   a. Draw the block diagram and explain the working principle of successive approximation type DVM.   **(10 Marks)**
   b. Explain the working of digital pH meter with the help of block diagram.   **(10 Marks)**

Module-3

5   a. Draw the block diagram of CRO and explain the functions of each block.   **(10 Marks)**
   b. Explain with a block diagram AF sine-square wane generator.   **(10 Marks)**

OR

6   a. Explain with a block diagram of function generator in detail.   **(10 Marks)**
   b. Explain the operation of digital storage oscilloscope with a help of block diagram.   **(10 Marks)**

Module-4

7   a. Explain with a help of a neat diagram, construction and principle of operation of Megger.   **(10 Marks)**

   b. Draw the Maxwell's bridge to determine inductance in terms of known capacitance and derive Q-factor and expression for inductance.   **(10 Marks)**

OR

8 a. Find parallel R and C. that causes a Wien's bridge to null with the following components values. $R_1 = 2.7 K\Omega$. $R_2 = 22 K\Omega$. $C_1 = 5 \mu F$. $R_4 = 100 K\Omega$ and operating frequency is 2.2 kHz. (10 Marks)

b. Explain susceptance method of Q-measurement. (06 Marks)

c. The self capacitance of a coil is to be measured by Q-meter. The first measurement result is $f_1 = 1.5$ MHz and $C_1 = 550$ PF. The second measurement result is $f_2 = 3$ MHz and a new value of tuning capacitor is 110 pf. Find the distributed capacitance and inductance. (04 Marks)

Module-5

9 a. What is transducer? Explain working of resistive position transducer with a neat sketch. (10 Marks)

b. What are the different types of photoelectric transducer? Explain photo voltaic transducer. (10 Marks)

OR

10 a. With a neat sketch. explain construction and working of LVDT. (10 Marks)

b. What is gauge factor? Derive an expression for gauge factor and prove that $K = 1 + 2\mu$. (10 Marks)

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